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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,059	08/08/2001	Evan Y.W. Zhang	ZYB 0001 PA	2617
7590 Evan Y. W. Zhang Zybron Inc. 3915 Germany Lane Beavercreek, OK 45431		07/11/2007	EXAMINER LEE, SHUN K	
			ART UNIT 2884	PAPER NUMBER
			MAIL DATE 07/11/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/925,059

Applicant(s)

ZHANG, EVAN Y.W.

Examiner

Shun Lee

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2007 and 24 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 44 and 48-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 44, 48-57 and 59 is/are rejected.
- 7) ☒ Claim(s) 58 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/8/01, 8/25/05, & 5/22/06 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 55 and 56 are objected to because of the following informalities:
 - (a) in claim 55, "said common lens" on line 6 should probably be --said common aperture comprises a common lens that--; and
 - (b) in claim 56, "a beam splitter" on line 2 should probably be --said beam splitter-- (see "a beam splitter" on line 5 in claim 52 and "beam splitter 126" in Fig. 4B).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 59 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Amended dependent claim **59** recites the limitation "said display device and said viewer are arranged such that optical fusion can be viewed on said viewer simultaneously with electronic fusion on said display device or optical fusion on said viewer and electronic fusion on said display device can each be viewed individually".

The specification (pg. 6, lines 21-23) discloses that "An eyepiece/display allows selective viewing of the first optical/electronic output, the second optical/electronic output, or the fused optical/electronic output". However, there does not appear to be a written description of a display device and a viewer arranged such that optical fusion and electronic fusion can be viewed simultaneously in the specification as filed.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 44 and 48-51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It should be noted that a claim may be rendered indefinite by reference to an object that is variable (MPEP § 2173.05(b)). Thus a limitation in a claim to a system that recited "wherein said target radiation is not filtered by any objective lens until after being split into said first optical path and said second optical path" is indefinite because the relationship of parts was not based on any known standard for selecting the transmission characteristics (*i.e.*, filtering characteristics) of any objective lens before said target radiation is split into said first and second optical paths, but on the spectra of an unspecified target radiation. Thus, *e.g.*, a system would be within the scope of recited in claim 44 when used to image first target radiation having spectra A (wherein a first objective lens before the target radiation is split does not filter the first target radiation) and the same system would not be within the scope of recited in claim 44 when used to image second target

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radiation having spectra B (wherein the same first objective lens does filter the second target radiation). Therefore, the claims are vague and indefinite.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The specification (pg. 1) describes the visible (VIS) band as ~0.4 μm to ~0.76 μm , the near infrared (NIR) band as ~0.76 μm to ~1.1 μm , the short wave infrared (SWIR) band as ~1.1 μm to ~3 μm , the medium wave infrared (MWIR) band as ~3 μm to ~7 μm , and the long wave infrared (LWIR) band as ~7 μm to ~18 μm .

7. Claims 44 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen (US 5,035,472) in view of Menke (US 3,379,830) and Owen (US 5,497,266).

In regard to claim 44, Hansen discloses (Figs. 2A-2C and 4) an image fusing system comprising:

(a) a camera having:

(a1) a common aperture (15, 14A) arranged to allow target radiation to enter said camera along a common optical axis (19);

(a2) a beam splitter (16A) arranged to receive said target radiation passed through said common aperture (15, 14A) and to split said target radiation into a first spectral band (e.g., visible and near infrared; column 3, lines 22-39) and

a second spectral band (e.g., 8 μm through 14 μm of a far infrared spectrum channel; column 3, lines 18-22) which is different from said first spectral band, wherein said target radiation in said first spectral band is directed along a first optical path and said target radiation in said second spectral band is directed along a second optical path;

(a3) a first sensor (28) arranged to receive said radiation in said first spectral band and to provide a first optical output representing a first optical image of said radiation filtered into said first spectral band (e.g., 0.5 μm through 1.1 μm of visible and near infrared spectrum channels; column 3, lines 22-39); and

(a4) a second sensor (18, 26) arranged to receive said radiation in said second spectral band and to provide a second optical output representing a second optical image of said radiation filtered into said second spectral band (e.g., 8 μm through 14 μm of a far infrared spectrum channel; column 3, lines 18-22);

(b) a beam combining device (56) arranged to optically fuse said first optical output from said first sensor (28) and said second optical output from said second sensor (18, 26) into a third optical output; and

(c) a viewer (12A) for viewing said third optical output; wherein:

said first sensor (28) and said second sensor (18, 26) share said common aperture (15, 14A) such that parallax between said first (28) and second (18, 26) sensor is inherently substantially eliminated due to said common optical axis (19).

Hansen also appears to disclose (Figs. 2A-2C) that said camera and said viewer (12A) are aligned (see 14 and 12 in Figs. 2A-2C) along said common optical axis (19) such that parallax between said camera and said viewer (12A) is inherently substantially eliminated due to said common optical axis (19). Alternatively, it would be obvious to one of ordinary skill at the time of the invention to provide a common optical axis in the system of Hansen, in order to obtain a mountable sight which is a physical substitute for a standard mountable telescopic sight. The system of Hansen lacks an explicit description of a first objective lens (transmissive to radiation in at least a portion of said first spectral band) in said first optical path between said beam splitter and said first sensor and a second objective lens (transmissive to radiation in at least a portion of said second spectral band) in said second optical path between said beam splitter and said second sensor, and wherein said target radiation is not filtered by any objective lens until after being split into said first optical path and said second optical path. However, Hansen further discloses (Fig. 4) said common aperture (15, 14A) comprises a common objective lens (14A). Since Hansen does not disclose and/or requires a specific common objective lens, one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified common objective lens of Hansen as any one of the known conventional common objective lens which would not require further description. Further, Menke teaches (Fig. 2) a common objective lens comprising a first concave mirror arranged to reflect radiation entering an aperture in order to observe images having different spectral ranges. It should be noted that a concave mirror reflects the radiation. In addition, Owen teaches (column 6, line 60 to column 7, line 10)

to provide aberration correcting lenses in order to correct for aberrations. Therefore it would be obvious to one of ordinary skill at the time of the invention to provide aberration correcting lenses proximate the sensors and a known conventional common objective lens (e.g., a concave mirror) as the unspecified common objective lens in the system of Hansen, in order to correct for aberrations.

In regard to claim **48** which is dependent on claim **44**, Hansen also discloses (Fig. 4) that said first sensor (28) comprises at least one of a charge coupled device or an image intensifier and generates said first optical output; and said second sensor (18, 26) comprises an infrared focal plane ray (18) and a display (26) to convert an electronic output of said FPA to a visible image corresponding to said second optical output.

8. Claims 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen (US 5,035,472) in view of Owen (US 5,497,266) as applied to claim 44 above, and further in view of Horn (US 6,335,526).

In regard to claims **50** and **51** which are dependent on claim **44**, the modified system of Hansen lacks a transmitter capable of wirelessly transmitting to a remote receiver a first electronic output produced by said first sensor and representing a first electronic image of said radiation filtered into said first spectral band, a second electronic output produced by said second sensor and representing a second electronic image of said radiation filtered into said second spectral band, and a third electronic output from a processor electronically fusing or combining said first electronic output and said second electronic output; and a display device arranged to selectively display

at least one of said first electronic output, said second electronic output, and said third electronic output. Horn teaches (column 3, line 1 to column 4, line 23) to obtain electronic images and fused images for automated target recognition wherein these electronic images and fused images can also be selectively displayed a display device with other relevant information and to provide a transmitter capable of wirelessly transmitting to a remote receiver electronic output representing the images, in order to communicate images and other relevant information to a command and control center. Therefore it would be obvious to one of ordinary skill at the time of the invention to obtain electronic images and fused images in the modified system of Hansen for automated target recognition which can be displayed and/or transmitted together with other relevant information to a command and control center.

9. Claims 52-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen (US 5,035,472) in view of Owen (US 5,497,266) and Horn (US 6,335,526).

In regard to claims **52** and **53**, the cited prior art is applied as in claims 50 and 51 above.

In regard to claim **54** which is dependent on claim 52, the cited prior art is applied as in claim 44 above.

In regard to claim **55** which is dependent on claim 52, the cited prior art is applied as in claim 44 above.

In regard to claim **56** which is dependent on claim 52, the cited prior art is applied as in claim 44 above.

In regard to claim **57** which is dependent on claim 52, the cited prior art is applied as in claims 48 and 50 above.

Allowable Subject Matter

10. Claim 49 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. Claim 58 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: the instant application is deemed to be directed to a nonobvious improvement over the invention patented in US Patent 5,035,472. The improvement comprises in combination with other recited elements, that said beam combining device comprises a narrow band filter to pass substantially all green light from said first sensor at a peak wavelength of near 0.55 micrometers with a bandwidth of near ± 0.01 micrometers, and to reflect substantially all other visible light from said display of said second sensor and to fuse said VIS/NIR and SWIR/MWIR/LWIR images as recited in dependent claims 49 and 58.

Response to Amendment

13. The declaration under 37 CFR 1.132 filed 16 January 2007 is insufficient to overcome the rejection of claims based upon Hansen as set forth in the last Office action because:

- (a) it refer(s) only to the system described in the above referenced application and not to the individual claims of the application (there is no showing that the objective evidence of nonobviousness is commensurate in scope with the claims since, e.g., different FOVs and focal lengths are not recited in the instant claims; see MPEP § 716); and
- (b) it include(s) statements which amount to an affirmation that the affiant has never seen the claimed subject matter before (this is not relevant to the issue of nonobviousness of the claimed subject matter and provides no objective evidence thereof; see MPEP § 716).

In regard to the allegation of unexpected results, the evidence relied upon should establish that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance (MPEP § 716.02(b)). As noted above, different FOVs and focal lengths are not recited in the instant claims. Nor does there appear to be a written description or enablement of optical fusion of different field of views in the application as filed.

In regard to the allegation of inoperability of US 5,035,472, it is to be presumed that skilled workers would as a matter of course, if they do not immediately obtain desired results, make certain experiments and adaptations, within the skill of the competent worker. Thus, the declaration must rebut the presumption of operability by a preponderance of evidence (MPEP § 716.07). Therefore, the lack of disclosure of optical elements alleged to be required is insufficient to rebut the presumption of operability.

Moreover, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness.

Response to Arguments

14. Applicant's arguments filed 16 January 2007 have been fully considered but they are not persuasive.

Applicant argues (last two paragraphs on pg. 11 to third paragraph on pg. 14 of remarks filed 16 January 2007) that support for the clarifying amendment can be found, for example, in Figs. 6A and 6B and corresponding description at US 2002/0030163 paragraphs 73-79. Examiner respectfully disagrees. First it is noted that Fig. 6A does not illustrate optical fusion whereas Fig. 6B does illustrate optical fusion. The specification states (pg. 22, lines 21-22) that "Referring to FIG. 6A, the sensor assembly 102 may be arranged to provide both an optical view of the target image as well as an electronic view of the target image". This appears to support "... said display device and said viewer are arranged such that ... optical fusion on said viewer and electronic fusion on said display device can each be viewed individually" as recited in amended dependent claim 59. However, the specification as filed does not appear to disclose "... said display device and said viewer are arranged such that

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optical fusion can be viewed on said viewer simultaneously with electronic fusion on said display device ... " as recited in amended dependent claim 59.

Applicant argues (first paragraph on pg. 12 to third paragraph on pg. 14 of remarks filed 16 January 2007) that Hansen fails to teach or suggest an optical system wherein the target radiation is not filtered by any objective lens until after being split into the first optical path and the second optical path since the objective lens 14A of Hansen defines a common objective lens that must filter the radiation that eventually travels to both the focal plane array 24 and the I² tube 28. Examiner respectfully disagrees. It is noted that applicant also states (last paragraph on pg. 15 of remarks filed 16 January 2007) that "Moreover, the optical paths are constrained by the efficiency and optical characteristics of a single objective, which is required to be transmissive of a wide band of wavelengths". Further, there is no evidence or explanation that a common objective lens must filter the radiation. On the contrary, a common objective lens should transmit all radiation that is to be imaged otherwise there would be no imaging if the radiation is not transmitted. Thus the common objective lens of Hansen implicitly transmits all radiation that is to be imaged. Alternatively, it would be obvious to one of ordinary skill that a common objective lens should transmit all radiation that is to be imaged.

In response to applicant's argument (last paragraph on pg. 14 to third paragraph on pg. 16 of remarks filed 16 January 2007) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, each optical path does not have the same field of view, focal length, etc.) are not recited in the rejected claim(s). Although the claims are interpreted in light of the

specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's arguments (first paragraph on pg. 17 of remarks filed 16 January 2007) against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues (last three paragraphs on pg. 17 of remarks filed 16 January 2007) that Horn explicitly teaches against the use of an image intensifier. Examiner respectfully disagrees. Horn teaches that image intensifiers cannot see 1.06 μm and 1.54 μm wavelengths. However, this does not constitute a teaching that an image intensifier cannot be used. Further, Hansen expressly teaches at least three distinct spectrum processing channels. Thus, Hansen does not require an image intensifier for at least one of the spectrum processing channels. Therefore, neither cited prior art reference teaches away from the combination.

Applicant argues (first three paragraphs on pg. 18 of remarks filed 16 January 2007) that there is no motivation to combine Horn and Hansen since Hansen discloses a sight for a rifle and Horn discloses goggle system. Examiner respectfully disagrees. Horn states (column 3, lines 64-65) that "Rifle mounted scope subsystem 27 includes the same sensors as disclosed for goggle subsystem 20". Thus Hansen and Horn both disclose at least one embodiment wherein the imaging system is a sight for a rifle.

In response to applicant's argument (first three paragraphs on pg. 19 of remarks filed 16 January 2007), the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Applicant argues (first paragraph on pg. 20 of remarks filed 16 January 2007) that there would be no motivation to combine these references as each reference would have to be modified to include substantial additional components. Examiner respectfully disagrees. There is no indication within Hansen that substantial additional components would destroy the intended use. On the contrary, Hansen expressly teaches at least three distinct spectrum processing channels. Therefore, Hansen teach or suggest that additional distinct spectrum processing channels (formed by additional components) is within the scope of the invention.

Applicant argues (second paragraph on pg. 20 of remarks filed 16 January 2007) that there is no teaching or suggestion that the limited field of view that can be achieved with a system as taught by Hansen would be of suitable for a goggle system that has been designed to allow for driving vehicles as taught by Horn. Examiner respectfully disagrees. As discussed above, Hansen and Horn both disclose at least one embodiment wherein the imaging system is a sight for a rifle. In addition, Hansen clearly discloses more than just a sight for a rifle. For example, Hansen states

(abstract) that "A multispectral sight integrated onto a man portable rifle or stand alone weapon device for sighting the rifle or for surveillance by the device. ... ". Thus, Hansen expressly teaches an imaging system for surveillance.

In response to applicant's argument (last paragraphs on pg. 20 to second paragraph on pg. 21 of remarks filed 16 January 2007) that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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